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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/928,737	08/13/2001	Son Ky Quan	SC09785T CD1	7252

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FREESCALE SEMICONDUCTOR, INC.  
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AUSTIN, TX 78729

EXAMINER
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NGO, HUNG V

ART UNIT	PAPER NUMBER
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2831

NOTIFICATION DATE	DELIVERY MODE
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01/13/2010

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

USADOCKETING@FREESCALE.COM

<b>Office Action Summary</b>	<b>Application No.</b> 09/928,737	<b>Applicant(s)</b> QUAN ET AL.	
	<b>Examiner</b> Hung V. Ngo	<b>Art Unit</b> 2831	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 23 February 2009.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 17 and 20-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 17, 20-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                    | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 17, 20-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tuttle et al (US 5,612,513).

Re claims 17, 23, 27, Tuttle et al disclose a packaged semiconductor device comprising: providing an interconnect substrate (44) having a plurality of substantially identical package sites arranged in an array, the plurality of sites being separated by a singulation space (Fig 3) and the interconnect substrate being a printed circuit board substrate (substrate 14 with a printed conductive trace 16)(col. 4, lines 24-30); mounting and interconnecting a semiconductor device (die 50)(col. 12, line 39-40) within each site; and overmolding a single and continuous encapsulant (60) over each semiconductor device, the plurality of sites, and the singulation space (Fig 4).

Tuttle shows a 3x4 array in Fig. 1 and Tuttle recites "Circuit array 10 is comprised of twelve individual circuits 12. However, a particular array can have a fewer or greater number of circuits 12" (col. 4, lines 1-5) and this meets the limitation of a 4x4 array.

Re claims 20, 24, 28, further comprising the step of singulating the plurality of package sites after overmolding (col 6, lines 45-50).

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Re claims 21, 25, 29, wherein singulating through the single and continuous encapsulant and the substrate along the singulation space comprises cutting which is equivalent to sawing through the single and continuous encapsulant and the interconnect substrate along the singulation space (col 6, lines 45-50).

The teaching as discussed above does not disclose wherein overmolding produces a top surface of the encapsulant which has a surface deviation of less than 0.13 millimeters across a length of the encapsulant (re claims 17, 23, 27). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the flat surface encapsulant of Tuttle et al by employing a surface deviation of less than 0.13 mm and modify the package sites arranged in at least a four by four array for intended use, since it has been held that where the general conditions of a claim are disclosed in prior art, discovering optimum ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

The teaching of Tuttle et al as discussed above does not disclose the step of handling each packaged semiconductor device with automated pick and place equipment (re claims 22, 26, 30). It is well known in the electrical art to use automated equipment for handling semiconductor device and also, automated equipment was discussed in appellant's background of invention (page 1, line 30). It would have been obvious to one having ordinary skill in the art at the time the invention was made use automated equipment with electronic circuit device of Tuttle for handling the device and for simplifying assembly process.

***Response to Amendment***

The declaration under 37 CFR 1.132 filed 02-23-2009 is insufficient to overcome the rejection of claims 17, 23, 37 based upon Tuttle et al as set forth in the last Office action because: the substrate or circuit board is not inherently rigid as evidence of Tuttle et al. Tuttle et al disclose a flexible substrate being a printed circuit board (substrate 14 with a printed conductive trace 16) (col. 4, lines 24-30). There is no evidence supporting the argument that the pick and place equipment to manufacture the flexible package of Tuttle et al may cause problems. Tuttle et al disclose a package encapsulant having a substantially flat surface (Fig 4).

***Response to Arguments***

Applicant's arguments filed 2-23-09 have been fully considered but they are not persuasive. Applicant argues (1) that Tuttle et al teach away from the use of a rigid substrate such as ceramic or a printed circuit board, (2) that Tuttle does not describe a top surface of the encapsulant which has a surface deviation of less than 0.13 mm across a surface of the continuous encapsulant, (3) that Tuttle et al teach a flexible final product using a flexible material substrate, only the individual enclosed circuits will have relative flat surface, (4) that the criticality of the claimed "surface deviation of less than 0.13 millimeters across a surface of the continuous encapsulant" has been shown by the evidence proffered in the attached declaration.

With respect to (1), the substrate of applicant's invention was not described as being rigid, the features upon which applicant relies (i.e., rigid) are not recited in the

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rejected claim(s). The substrate or circuit board is not inherently rigid as evidence of Tuttle et al. Tuttle et al disclose a flexible substrate being a printed circuit board (substrate 14 with a printed conductive trace 16) (col. 4, lines 24-30).

With respect to (2), Tuttle et al disclose a top surface of the continuous encapsulant having a substantially flat surface (Fig 4) and the feature of “surface deviation of less than 0.13 mm across a surface of encapsulant” has been addressed above.

With respect to (3), Tuttle et al disclose a top surface of the continuous encapsulant having a substantially flat surface (Fig 4).

With respect to (4), the criticality of surface deviation of the encapsulant was not discussed in the original specification.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung V. Ngo whose telephone number is (571) 272-1979. The examiner can normally be reached on Monday to Friday 9:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego Gutierrez can be reached on (571) 272-2800 EXT 31. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Hung V Ngo/  
Primary Examiner, Art Unit 2831